

REMARKS

Claims 1-9 and 11.20 are pending in the application.

Claims 1 and 19 are amended above to overcome the examiner's section 112 and/or section 101 rejections.

No new matter has been added to the application by way of these specification and claim amendments.

I. THE SECTION 112, FIRST PARAGRAPH REJECTIONS

A. The Rejection Of Claims 11-20

The examiner rejected claims 11-20 for failure to describe so as to enable one of ordinary skill in the art to make or use "processing means for processing signals received . . . " and "computer apparatus programmed to implement a blind signal separation technique. . . " The claim features are enabled and described in the specification for at least the reasons recited below.

The claim feature of "processing means for processing signals ...technique" of claim 19 part c is fully supported and enabled by the specification. Indeed, one embodiment of the claimed "processing means" is the lead box 34 with circuitry 34a illustrated in Figure 3 and described in Applicant's specification at page 3 lines 3-22. It incorporates amplifiers 37, filters 38 and an analogue to digital converter 39. It is observed that "processing means" cannot be interpreted as software because the processing means takes electrode signals which are analogue and turns them into digital signals, and software cannot do this.

The Applicant has further clarified claim 19 by replacing the processing means feature with an electronic signal processing circuitry, which one of ordinary skill in the art would have no difficulty in making or using.

Regarding the rejection of claims 11-20 on the basis that there is no disclosure of software for the "computer apparatus programmed to implement a blind signal separation technique suitable for separating stationary signals *etc.*" (claim 19 part d), this is respectfully traversed because Applicant's specification does make such disclosure. For example, page 16 line 12 to page 22 line 23 discusses signal separation using ICA at length. Also it is stressed that

blind signal (or source) separation is prior art. In this regard the Examiner's attention is respectfully directed to US 2005/0105644, the US equivalent of International Patent Application No. WO 03/073612 A2 cited in Applicant's specification at page 17 line 13. The introduction to US 2005/0105644 gives a substantial review of prior art for solving the instantaneous mixing problem (i.e. blind signal (or source) separation –see Applicant's specification at page 17 lines 5-7) such as the following:

- a) "JADE ": J F Cardoso and A Souloumiac, "Blind Beamforming for non-Gaussian signals", IEE proceedings-F Vol 140 No 6 December 1993;
- b) "SOBI": A. Belouchrani, K Abed-Meraim, J Cardoso and E Moulines, "A Blind Source Separation Technique Using Second Order Statistics", IEEE transactions on signal processing, Vol 45 No 2 February 1997;
- c) "BLISS": I.J. Clarke, "Direct Exploitation of Non-Gaussianity as a Discriminant". EUSIPCO 1998, September 1998; and
- d) "Fast ICA": A. Hyvarinen, E. Oja, "A Fast Fixed-Point Algorithm for Independent Component Analysis", Neural Computation 9, P1483-1492, 1997.

Applicant respectfully traverses the objection that the specification does not disclose how to make the software referred to above in terms of an algorithm, because Applicant has disclosed the ICA algorithm per se. (See e.g. Applicant's specification at page 16 lines 20-23 and page 20 line 6 to page 22 line 16). Applicant has not provided logic diagrams of software or code listings because it is commonplace to turn prior art mathematical techniques into software, and one of ordinary skill in the art can be presumed to be able to do this.

The examiner's rejection of claims 11-20 under the first paragraph of section 112 should be withdrawn because, as demonstrated above, the specification describes and enables a person skilled in the art at the time of the invention to practice Applicant's invention.

B. The Rejection Of Claims 1-9

The examiner rejected claims 1-9 for failing to describe so as to enable one of ordinary skill in the art to make or use the software "techniques" claimed. The Applicant agrees that the blind signal separation technique in claim 1a) is computer implemented using software. Here again the remarks of the immediately preceding paragraph above apply: i.e. Applicant has disclosed an algorithm, and one of ordinary skill in the art can be presumed to be able to turn prior art mathematical techniques into software.

The examiner's rejection of claims 1-9 under the first paragraph of section 112 should be

withdrawn because, as demonstrated above, the specification describes and enables a person skilled in the art at the time of the invention to practice Applicant's invention.

II. THE SECTION 112, SECOND PARAGRAPH REJECTIONS

A. The Rejection Of Claims 1-9

The examiner rejected claims 1-9 for being indefinite for omitting an essential step, namely monitoring electrical muscular activity.

Applicant does not understand this objection because "electrical muscular activity" appears in claim 1 first line. Thus, at minimum the examiner should recognize that the claim preamble provides the required feature. Applicant has also amended claim 1b) second line by adding "electrical" to muscular activity in case the objection is based on this. Applicant believes that the term "electrical" to be unnecessary in claim 1b) because the feature is implicit from the limitation "electrodes", which cannot detect anything other than electrical signals.

For each of these reasons, the examiner's rejection of claims 1-9 under the second paragraph of section 112 is overcome or traversed

B. The Rejection Of Claims 11-20

The examiner rejected claims 11-20 for being indefinite because it is unclear whether "processing means" is directed to hardware. As has been noted above, Applicant has amended claim 19 to replace processing means by electronic signal processing circuitry. The amendment is intended to make it clear that "processing means" – which is no longer a claim feature – is directed to hardware. It is believed that this amendment also overcomes the examiner's further objection that claims 11-20 are indefinite because it is unclear whether or not the "processing means" (claim 19 part c) is the same as the "computer apparatus" (claim 19 part d). The electronic signal processing circuitry is hardware and the computer apparatus is (different) hardware plus software.

For at least this reason, the examiner's rejection of claims 11-20 under the second paragraph of section 112 should be withdrawn.

III. THE SECTION 101 REJECTIONS

Claims 1-9 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. The Examiner states that, to qualify as a 35 U.S.C. § 101 statutory process, the claims

should positively recite the other statutory class (apparatus or thing) to which it is tied, for example by identifying the apparatus that accomplishes the method steps. Applicant has amended claim 1 to recite that computer apparatus is used to apply the blind signal separation technique, and that a display device is used to display the separate muscular source to a user (this is based on Applicant's specification at page 27 lines 2-4).

Claims 1-9 and 11-22 are rejected under 35 U.S.C. 101 on the grounds of lacking patentable utility. The Examiner states that MPEP 2106 IV C 2 requires that a claimed invention "(A) 'transforms' an article or physical object to a different state or thing; or (B) otherwise produces a useful, concrete and tangible result, based on the factors discussed below."

As regards claims 1-9, as has been said claim 1 (from which claims 2-9 depend directly or indirectly) as amended recites using a display device to display the separated muscular source using to a user. This is a useful, concrete and tangible result because it enables a clinician to monitor the progress of pregnancy.

As regards claims 11-20, as has been said claim 19 (from which claims 11-18 and 20 depend directly or indirectly) as amended recites a display device for displaying the separated muscular source to a user. This is a useful, concrete and tangible result because here again it enables a clinician to monitor the progress of pregnancy.

For at least the reasons recited above, claims 1-9 and 11-20 are believed to recite patentable subject matter.

CONCLUSION

The examiner's specification and claim objections and rejections are overcome or they are traversed for at least the reasons discussed above. Favorable reconsideration and allowance of all pending application claims is, therefore, courteously solicited.

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